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ABSTRACT

A 2-week study was conducted to determine what effect the practice of cooperative learning had on the rote memorization of 51 prepositions in ninth-grade English classrooms. One class of 15 students acted as a control group, memorizing the prepositions independently, in a traditional setting. Another class of 15 students acted as the experimental group, studying the prepositions in learning groups. Each group was given the same time parameters and was tested independently. Grades were based on the percentage of prepositions memorized. The control student's grade was based on his/her own achievement, while the experimental student's grade was composed of 75% on his/her own achievement and 25% on the achievement of his/her learning group. Results indicated that there was no significant difference in the results of the two groups although the experimental group posted the greatest gain. (Two tables of data are included and 20 references are attached.) (MG)

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COOPERATIVE LEARNING-
ITS EFFECT ON ROTE MEMORIZATION

by

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for the Master of Arts Degree
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ABSTRACT

The purpose of this study was to see what effect the practice of cooperative learning had on the rote memorization of prepositions in ninth-grade English classrooms.

One of the proficiencies of the general track of Red Bank Regional High School ninth grade classes is the knowledge of fifty-one prepositions. In this study one freshman class of fifteen students acted as a control group, memorizing the prepositions independently, in a traditional setting. Another class of fifteen freshmen acted as the experimental group, studying the prepositions in learning groups. Each group was given the same time parameters and were tested independently. Grades were based on the percentage of prepositions memorized. The control student's grade was based on his own achievement, while the experimental student's grade was composed of 75% of his own achievement and 25% on the achievement of his learning group. Results showed that there was no significant difference in the results of the two groups although the experimental group posted the greatest gain.

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Cooperative learning is not a new concept. In early America (and until recently in outlying rural areas) the practice of student-helping-student was a fact of life- born of necessity. In one-room schools where one teacher had to serve children of different ages, grades, and abilities, cooperative learning was the only way to attend to the needs of everyone.

A variation of cooperative learning appeared in American schools in the early 1950's, under the name "homogeneous grouping." Many teachers of today remember being a "robin" or "bluebird" in the reading groups of elementary school. Maria Montessori incorporated a form of peer learning as an essential part of her teaching method popular in the 1960's. In the later 1960's, Thelan suggested that children working together to learn was a promising alternative to the competitive, teacher-directed classroom.

Today, with a new image, collaborative learning is among us, alive and well. Many educators in America and elsewhere are researching different collaborative learning strategies using groups of different sizes, ages, and in different subject areas. Robert Slavin, a prominent educator associated with the Center for Research in Elementary and Middle Schools, The Johns

Hopkins University, has done and continues to do substantial research on collaborative learning. In "Cooperative Revolution Catches Fire," he speaks of forty studies done both in America and abroad which examine cooperative learning and its aspects. Thirty-five of those studies showed "significantly greater achievement for the cooperatively taught classes." The other five studies showed no appreciable difference. (Slavin, 1988)

Ann Duin, in a paper presented at the Annual Meeting of the Minnesota Council of Teachers of English, reported that the results of over 800 studies suggested that students who learn via cooperative learning groups, " 1) achieve more, 2) have more positive attitudes about school, subject areas, and teachers, and 3) are more positive about each other." (Duin, 1984)

Annette Magid, in "Cooperative Communication: A Study of Group Interaction," reported that studies showed that cooperative learning students scored 15% more A's than B's than their traditionally-taught peers. (Magid, 1988)

On the other hand, there have been reports of studies without success, and these too must be considered. Robert Lazarowitz, in a Science Education

Journal article reported on a controlled study which compared teacher-centered achievement results with achievement from students involved in cooperative learning. He noted that academic results were inconclusive. (Lazarowitz, 1988) Rita Wolfe Pearson also noted no statistical difference between the academic gains of cooperative learning students and their traditionally-taught peers. This was reported in her article entitled, "Cooperative Learning in an Urban Science Classroom." (Pearson, 1989)

Aside from any gains that may be produced by cooperative learning, there is an indication that the process of collaboration itself may further prepare students for future job markets. The American Society for Training and Development has identified sixteen basic skills that will be needed for job placement in the twenty-first century. Among them are personal and personnel management, self esteem, group effectiveness, interpersonal skills, negotiation, teamwork, and organizational effectiveness. These are the very skills that surface when people have experience working with other people to accomplish goals. (Work America, 1990)

HYPOTHESIS

To provide more information about cooperative learning, the following study was undertaken. It was hypothesized that children who were taught using a cooperative learning approach would not score significantly higher academically than their traditionally-taught peers.

DEFINITIONS, ASSUMPTIONS, LIMITATIONS, DELIMITATIONS

Definitions

Cooperative learning is defined as a learning strategy that groups children of mixed abilities for learning purposes. In this study, the term collaborative learning will be used interchangeably with cooperative learning.

Interpersonal skills are defined as those skills necessary to facilitate cooperation between people. The term is synonymous with socialization skills.

Unmotivating task refers to the rote memorization of fifty-one prepositions, a task in the English I curriculum at Red Bank Regional High School, deemed necessary for the elimination of subject/verb agreement problems in the course of writing.

Assumptions

For the purpose of this study, it was assumed that past failures to master the task of rote memorization of prepositions had no organic etiology, and that students had no other motivation to learn that had not been present in the past.

Limitations

Due to the fact that this study was done within the constraints of a normal school day at Red Bank Regional High School, the time of day chosen for the study could not be the same for all groups. Additionally, the past experiences of the students would not be the same, although an effort was made to have each group composed of students with similar backgrounds and experiences.

Delimitations

Only one phase of one subject area was utilized for this study. The students involved in this study were in ninth-grade English classes on a general (middle) track. Due to the time restraints posed by the English I curriculum, this study was of a two-week duration.

There existed a possibility that prior relationships between students could have resulted in already formed attitudes and friendships that might have influenced the performances of the cooperative groups.

PROCEDURES

The subjects were ninth grade students from the four sending districts (plus tuition-paying Performing Arts students) that comprise the student body at Red Bank Regional High School, Little Silver, New Jersey. These districts include a predominately white-collar area, a predominately blue-collar area, and an area with a large Black and Hispanic population.

Two English I General (middle-level track) classes were used for the study. Students are placed in the 'General' level as a result of eighth-grade class scores, MATests, and teacher recommendations. The control group consisted of fifteen students, 11 boys and 4 girls. Their class met in the early afternoon. The experimental group also contained fifteen students, 9 boys and 6 girls. Their class met in mid-morning.

Before the experiment began, both classes were told to read the chapter on prepositions and prepositional phrases in Warriner's Third Course English, paying special attention to the list of fifty-one prepositions listed at the end. Three days later, both groups were told to write, from memory, as many of the fifty-one prepositions as they could. This "test" was used as a pretest for the study.

The study began with a discussion of the upcoming assignment. The reason for knowing and recognizing prepositions was explained to both groups. Memory-enhancing techniques were explained (equally) to both groups. Each group was given fifteen minutes a day, three days a week, in which to study. The study sessions took place at the end of the regularly-scheduled class and were held over a two-week period.

The control group was told they would have to study individually. They were encouraged to use any of the memory-enhancing techniques, or ones of their own choosing.

The experimental group was divided (by the instructor) into groups of four or five students. They were told that, for the purpose of studying, they would be allowed to work together; however, the test would be taken individually. It was further explained to the experimental group that their final test score would be 75% of the own personal achievement on the test, and 25% would be the average of the group's test score. This was done to provide the motivation and encouragement for all individuals in the group to help each other learn the material. The experimental group

was also reminded of group process techniques which all Red Bank Regional High School freshmen learn in Student-to-Student programs. This was done to facilitate working together in groups.

Both groups utilized flash cards, zeroxed copies of the preposition lists (which they tried to reproduce from memory), and various mnemonic devices. Throughout the experiment, the teacher circulated around the room, making sure that the students were on task.

At the end of the study, a post test was administered. As with the pretest, the instructions to the students were simply to write, from memory, as many of the fifty-one prepositions as could be remembered. In both classes the test was taken individually.

RESULTS

Prior to the experiment, all students were asked to write as many of the fifty-one prepositions as they could remember from their reading. The results were used as a pretest .

As Shown in Table I, there was no significant

TABLE I

MEAN, STANDARD DEVIATION AND t TEST OF THE PRETEST SCORES OF THE CONTROL AND EXPERIMENTAL SAMPLES			
	Mean	Standard Deviation	t Test
Experimental	4.79	3.26	.47
Control	5.49	4.34	

difference between the mean scores of the pretest (the experimental sample's mean of 4.79 as compared with the control sample's mean of 5.40). It was concluded that at the start of the experiment the two groups had a similar knowledge of the fifty-one prepositions.

The data shown in Table II indicates that the t

TABLE II

MEAN, STANDARD DEVIATION AND t TEST OF THE POSTTEST SCORES OF THE CONTROL AND EXPERIMENTAL GROUPS			
	Mean	Standard Deviation	t Test
Experimental	34.58	14.63	1.03
Control	29.87	11.27	

of 1.03 did not approach significance when comparing

the experimental group's mean score of 34.58 and the control group's mean score of 29.87, the mean difference being less than 5 points.

Comparing the data from Table I with Table II, it can be concluded that both groups made a substantial gain in their knowledge of prepositions. It is also noted that the experimental group made a greater gain.

CONCLUSIONS

The hypothesis that there would not be a significant difference between the experimental and control samples in terms of preposition memorizing as a result of the treatment was supported in that although the experimental sample achieved a higher score on prepositions learned, that score was not significantly higher. The conclusion, therefore, is that cooperative learning is not conclusively **the** one best method for fostering academic gain in preposition learning. It should be noted, however, that in this study, the experimental group's mean gain of 30 was greater than the control group's gain of 24.

IMPLICATIONS

While it is true that a cooperative learning situation hasn't been proven to be better than a traditional approach (where academic gain is the object), neither has it been proven significantly less productive. In fact, there seems to be indications that cooperative learning can benefit the teacher, the students, and the learning environment as a whole.

Students in the experimental group of this study took a greater interest in the assignment than did their control group counterparts. They looked forward to their study times and were sorry when the study reached an end. In addition, they were more interested in their grades. (The control group students never asked what their grades were. The experimental group asked every day until the grades and papers were returned to them.

The teacher in whose class the study took place thought that the experimental group's class was more enjoyable and easier to control. She noted that less discipline was required in the experimental class to keep the students on task than in the control group (where she called it, "the longest 15 minutes in the day.")

A final positive outcome of the experimental group's endeavor was the fact that students became (and so far remain) friendlier toward each other. In a school where students come from different backgrounds and sending districts, erasing hostilities and aggressive competitiveness is an ongoing goal. Thus, cooperative learning may be a key factor in achieving positive social interaction. The implication of these observations is that further research is desirable.

COOPERATIVE LEARNING
RELATED RESEARCH

Studies of collaborative education involving school-age children have been divided into two general categories- projects involving students of different age groups and grades, and projects involving students within the same grade, either homogeneously or heterogeneously grouped. Some projects involved peer tutoring while others utilized cooperative groupings.

Studies have reported the success of programs utilizing students of different grade levels, notably those which use older students to facilitate the learning of younger ones. Aside from gaining insight into the cooperative process itself, educators have been studying the possibility that older children provide the motivation, language, and understandability that aid the learning experiences of younger students.

A cross-age program developed by Lippett and Lippett (1968) and implemented in a California school district posted academic gains by both the student teachers and student learners. This suggests that in cross-age tutoring, both the instructor and the learner benefit from the pairing. However, it was also noted that in this study, the results of academic gains were declared

ambiguous, despite careful implementation and evaluation (as reported by Devin, Sheehan, Feldman, and Allen, 1976)

The results of several other studies show that peer tutoring benefits the tutor more than the tutee. Dunson reported that "the greater achievement of peer teachers over peer students or individuals using self-instruction is due to the fact that more cognitive processing of the information is necessary in order to teach the material." (Dunson, 1977)

Cooper reported that classroom teachers can enhance the learning of the entire class by allowing children to develop an area of expertise and helping them teach it to others. (Cooper, 1982)

Gartner, Kohler, and Riessman reported that peer tutoring methods were successfully used in a Los Angeles school district program begun in 1967. Fifth and sixth graders worked with first graders, and the first graders helped each other. So successful was the program that it was expanded to include parents, teachers, and community members. This program was mentioned as one of the reasons for the improved reading scores of minority students in the district. (Gartner, Kohler, and Reissman, 1971)

Studies also support the theories that cooperative strategies are particularly beneficial to disadvantaged, underachieving, and interracial groups. R. Cloward studied a program that used high school students as tutors for low-achieving elementary school pupils. The high school students, all tenth and eleventh graders, were given training prior to their working with the students- all fourth and fifth graders who were reading well below grade level. The high school students worked with their tutees one-to-one two afternoons per week. Control students of the same abilities received no extra help. Seven months after the start of the program, both control and experimental students were tested. The experimental gains over the control group's gains were notably higher. (Cloward, 1967)

Hasset reported on the seven-year success rate of the High School Helper Program, which targeted students in fifty-eight New York City high schools who were two or more years below grade levels in math and/or reading. Funded by the New York State Urban Education Project, the students received tutoring by peers in any high school subject. Emphasis was put on reading and study skills. Overall benefits included reinstatement

of athletic eligibility for some students as well as higher scores on standardized tests. (Hasset, 1974)

The National Commission on Resources for Youth's program, called "Youth Tutoring Youth," was another program designed to aid disadvantaged youth. In a review in Review of Educational Research, Devin-Sheehan, et al (1976) reported that both peer teacher and student gained as a result of the experiment. The tutor gained in self - confidence and language skills ability while the student-learner gained in reading interest, reading skills, self-confidence, and improved social skills.

Another study was conducted in Austin, Texas to determine what, if any, the effects of interdependent learning groups had on attitudes of ethnically mixed students concerning school and each other. 304 fifth-grade students from thirteen classes in seven schools were used in the study. The subject matter consisted of the district-selected Social Studies text and math text. The control groups were taught in a traditional, teacher-directed manner. The experimentals were broken into groups of four members each. Each student had to learn one part of the material and teach it to the others. The success of the group was based

on all group members learning all of the material. The results showed that experimental subjects increased in their liking for school and other students at a higher rate than the controls. The experimental groups, which included Anglos, Blacks, and Mexican-Americans, also increased significantly in self-esteem over the control groups. Edwin Aronson, who conducted the study, concluded it with the implication that the cooperative technique could be used to improve over-all student relations within a school, increase the liking of school for many students, and, because of the increase in self-esteem, might increase the students' abilities to learn. (Aronson, et al, 1977)

Vasallo reported on a similar study in Dallas' Independent School District. The study was looking into the effects of peer tutoring on relationships between races. Jim Daniel, the organizer of the project, reported that without a doubt, cooperative learning had the ability to diffuse racial inequalities. With students working **with** each other instead of competitively against, the implied success for academic achievement of all students was much greater. (Vasallo, 1973)

Most of the research (and the most appropriate research in relation to this study) deals with collaborative learning involving students of nearly the same age. Stevens, et al, reported that in the past 18 years, more learning groups consistently achieve more than do students in traditionally structured classes. (Stevens et al, 1987)

Robert Slavin, of the Johns Hopkins University, Baltimore, has been an untiring researcher and staunch advocator of the cooperative learning approach. In an article, "Cooperative Revolution Catches Fire," he envisions a system with total cooperation between peers, parents, teachers, administrators, and community-all working together. Having conducted substantial research, he concludes that a cooperative community is not only possible, but offers great gains in skills necessary for success in the next century. He noted, however, that two conditions were necessary for positive results to be obtained.

First, students must be working toward a group goal such as earning certificates or other recognition. Second, success at achieving this goal must depend on the individual learning of all groups. (Slavin, 1988)

Employing these two conditions, Slavin himself conducted forty studies, both here and abroad, which compared the

cooperative approach to traditional methods. The studies were conducted at grades two to twelve and in subjects such as language arts, math, writing, reading, science, and social studies. Cooperative learning posted significantly greater achievement in 35 of the studies. The other five studies found no difference between the two approaches. (Slavin, 1988)

Frederick Erickson reported on a study conducted with three classes of elementary school children. He reported

Not only did the level of student engagement go up as classroom tasks became more collaborative, but the quality of student performance increased as well. (Erickson, 1989)

After studying peer tutoring programs in Los Angeles, Elliot concluded that the collaborative effort is extremely effective in "achieving the basic goals of public education, namely the cognitive, affective, and social development of the child." (Elliot, 1977)

Land undertook a study of literature related to the effect of peer tutoring on student achievement in contemporary classrooms. He concluded that peer tutoring is a valuable teaching tool that can both increase academic achievement and the self-concept of the student teacher and learner. (Land, 1984)

Fehring reported that interpersonal skills, positive interdependences, and individual accountability all developed well in the process of using cooperative learning approaches in the classroom. (Fehring, 1987)

Pierce supported this effect, noting that the learner gained not only in academic achievement through the use of cooperative learning strategies, but gained in self-esteem as well. In addition, it was reported that the student teacher also gained academically, in self-esteem, and in social skills- achieving more than students not having this 'teaching' opportunity. (Pierce, 1983)

Cooperative learning in the classroom does not come easily nor does it come spontaneously. It requires careful planning and education on the part of the teacher, and at least some basic instruction in social skills on the part of the students.

Slavin's (1988) approach to cooperative learning in the classroom is to use unit-type programs. The simplest of these is the Student Team Learning approach, called Student Teams-Achievement Division (STAD). In a unit of activities, the teacher first presents a lesson to the class; students then work

in four-member, mixed-ability teams to master the presented material. The students then take quizzes (individually) on the material. The results of the quizzes are summed to form team scores.

Two other major programs, successfully researched by Slavin, are the Team Accelerated Instruction (TAI) in mathematics, and Cooperative Integrated Reading and Composition (CIRC) in reading, writing, and language arts. TAI uses four-member teams who work together to help each other master the work. Testing is done individually. In CIRC, a basal reader and reading groups are used. Students from different groups are paired and work together on reading skills. The teacher remains free to work with small groups and provide essential help.

Spencer Kagan (1989) advocates a more gradual classroom approach to cooperative learning through the use of "structures," a strategy adapted to the task at hand. By using one or more structures, teachers can design cooperative learning experiences to fit any subject and any situation. The structures "differ in their usefulness in the academic, cognitive, and social domains as well as in their usefulness in different steps of a lesson plan." All in all,

Kagan offers several dozen structures and many more variations on those structures. A teacher who knows the structures can move in and out of them as she sees fit in order to achieve learning objectives. (Kagan, 1989)

Johnson and Johnson stress the need for interpersonal and small-group social skills before cooperative learning can experience success. (1989)

James Schultz, in "Cooperative Learning: Refining the Process," (1989) agrees. He reminds us that students have had years of "do your own work--eyes on your own paper" practice. Not only must these practices be undone, but new practices must be introduced and reinforced. Before students are exposed to academics through cooperative learning, they must have spent time in the practice of group process itself. The ability to process will, according to Yager, (1985), increase achievement. It will also (according to Putnam et al, 1989) improve the quality of relationships developed among students.

The results of most studies that deal with cooperative learning- be it cross-age, tutor/tutee, or grouping, indicate that academic gains could be expected if the processes were correctly presented.

In addition to the academic gain, cooperative learning offers some exciting implications for reducing racial problems, increasing student interest in school, improving the self-confidence of students, and providing more of the socialization and interpersonal skills required in the workplaces of the twenty-first century. With correct implementation, cooperative learning has the potential to offer the teacher more time to help students in need. In addition, cooperative learning reduces the need for the creation and correction of 'busy work.' Finally, due to the elimination of competition in the classroom, a more relaxed atmosphere suggests a better learning environment for everyone. It appears that the result justifies the effort.

9

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APPENDICES

APPENDIX A

Raw Score of Pre and Post Tests for Control Sample

Subject	<u>Raw Score</u>	
	Pre	Post
1	1	17
2	3	15
3	3	12
4	7	19
5	1	26
6	2	16
7	18	15
8	4	39
9	5	42
10	6	40
11	7	44
12	5	26
13	7	44
14	10	24
15	2	44

APPENDIX B

Raw Score of Pre and Post Tests for Experimental Sample

Subject	<u>Raw Score</u>	
	Pre	Post
1	6	19
2	12	49
3	6	50
4	4	33
5	6	48
6	7	37
7	0	22
8	2	48
9	4	14
10	9	20
11	5	41
12	5	49
13	5	46
14	0	49
15	6	22

APPENDIX C

Gain in raw score from Pre and Post Tests
for Control Sample

Subject	Gain
1	+16
2	+12
3	+9
4	+12
5	+25
6	+14
7	-3
8	+35
9	+37
10	+34
11	+37
12	+21
13	+37
14	+14
15	+42

APPENDIX D
Gain in raw score from Pre and Post Tests
for Experimental Sample

Subject	Gain
1	+13
2	+37
3	+44
4	+29
5	+42
6	+30
7	+22
8	+46
9	+10
10	+11
11	+36
12	+44
13	+41
14	+49
15	+16

APPENDIX E
List of Prepositions
Used for Memorization

aboard	in
about	inside
above	into
across	like
after	near
against	of
along	off
among	on
around	out
at	outside
before	over
behind	past
below	since
beneath	through
besides	throughout
between	till
beyond	to
but	toward
by	under
concerning	underneath
down	until
during	up
except	upon
for	with
from	within
	without